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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LANDAU, MATTHEW C

ART UNIT PAPER NUMBER

2815

DATE MAILED: 09/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/669,448

Applicant(s)

HIROYAMA ET AL.

Examiner

Matthew Landau

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 9-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_ 6) ☐ Other: \_\_\_\_

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## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of Group I in Paper No. 5 is acknowledged.

Claims 9-16 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 5.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, and 4-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitations "the side surface" in line 12, "the upper surface" in line 13, "the distance t" in line 15, "the relation" in line 16, "the composition ratio" in lines 17, 18 and 20, and "said distance" in line 21. There is insufficient antecedent basis for these limitations in the claim.

Claim 2 recites the limitations "the composition ratio" in lines 3 and 4, "the sum" in lines 4 and 7, and "the contents" in lines 3 and 7. There is insufficient antecedent basis for these limitations in the claim.

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Claim 4 recites the limitations "said distance t" and "the relation" in line 17. There is insufficient antecedent basis for these limitations in the claim.

Claim 5 recites the limitation "said distance t" in line 22. There is insufficient antecedent basis for this limitation in the claim.

Claim 6 recites the limitation "said distance t" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 7 recites the limitations "the upper surface" in line 5, "the {100} plane" in lines 5 and 6, and "the <011> direction" in line 7. There is insufficient antecedent basis for these limitations in the claim.

Claim 8 recites the limitations "the upper surface" in line 11, "the {100} plane" in lines 11 and 12, and "the <011> direction" in line 13. There is insufficient antecedent basis for these limitations in the claim.

### *Double Patenting*

3. Applicant is advised that should claim 7 be found allowable, claim 8 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al. in view of Okajima et al.

In regards to claim 1, Figure 1 of Hayashi et al. (US Pat. 5,960,019, hereinafter Hayashi) discloses a semiconductor laser device comprising: a substrate 1; 5 a first conductivity type cladding layer 4; an emission layer (5,6,7); a second conductivity type cladding layer (8,10) containing Al as a group III element and formed with a ridge portion 10; and a current blocking layer 13, formed on said second conductivity type cladding layer (8,10) around said ridge portion 8, containing Al as a group III element in this order, wherein the distance  $t$  between said emission layer (5,6,7) and said current blocking layer 13 satisfies the relation of  $t \leq 0.275 / (1 - (X2 - X1))$  [  $\mu\text{m}$  ] assuming that  $X1$  (0.45) represents the composition ratio of Al in group III elements forming said second conductivity type cladding layer (see column 8, lines 49-51),  $X2$  (0.53) represents the composition ratio of Al in group III elements forming said current blocking layer and  $t$  (0.25  $\mu\text{m}$ ) represents said distance (see Table 1), and a lower width  $W$  of said ridge portion is 4.5  $\mu\text{m}$  (see column 10, lines 22 and 23). The difference between Hayashi and the claimed invention is an angle  $\theta$  of inclination on the side surfaces of said ridge portion with respect to the upper surface of said substrate is at least 70 degrees and not ore than 117 degrees. Figure 1 of Okajima et al. (US Pat. 5,065,404, hereinafter Okajima) discloses a cladding layer

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18a formed with a ridge portion. It can be clearly ascertained from Figure 1, the angle of inclination of the ridge portion with respect to the substrate is 90 degrees. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Hayashi by changing the angle  $\theta$  of inclination to 90 degrees. The ordinary artisan would have been motivated to modify Hayashi in the manner described above for the purpose of simplifying the fabrication process.

In regards to claim 2, Hayashi discloses said first conductivity type cladding layer 4 contains Al and Ga as group III elements, and  $X_1$  (0.45) represents the composition ratio of Al in the sum of the contents of Al and Ga (see column 8, lines 37-40), and said current blocking layer 13 contains Al and Ga as group III elements (see column 8, lines 65 and 66), and  $X_2$  (0.53  $\mu\text{m}$ ) represents the composition ratio of Al in the sum of the contents of Al and Ga (see Table 1).

In regards to claim 3, Hayashi discloses said second conductivity type cladding layer 8 is made of  $\text{Al}_{X_1}\text{Ga}_{1-X_1}\text{As}$  (see column 8, lines 49-51), and said current blocking layer 13 is made of  $\text{Al}_{X_2}\text{Ga}_{1-X_2}\text{As}$  (see column 8, lines 65 and 66).

In regards to claim 4, Hayashi discloses said distance  $t$  satisfies the relation of  $t \leq 0.252/(1 - (X_2 - X_1))$  [ $\mu\text{m}$ ].

In regards to claims 5 and 6, Hayashi discloses said distance  $t$  is equal to 0.25  $\mu\text{m}$  (see Table 1).

6. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi and Okajima as applied to claim 1 above, and further in view of Narui et al.

In regards to claim 7, a further difference between Hayashi and the claimed invention is the upper surface of said substrate is the  $\{100\}$  plane or inclined by several degrees from the  $\{100\}$  plane, and said ridge portion extends in the  $\langle 011 \rangle$  direction. Figure 1 of Narui discloses a semiconductor laser wherein the substrate 1 has a (100) surface orientation and a ridge portion extending in the  $[011]$  direction (see column 1, lines 12-31). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to further modify the invention of Hayashi by orienting the upper surface of the substrate in the  $\{100\}$  plane and extending the ridge portion in the  $\langle 011 \rangle$  direction. The ordinary artisan would have been motivated to modify Hayashi in the manner described above for the purpose of fabricating a low threshold current semiconductor laser.

In regards to claim 8, a further difference between Hayashi and the claimed invention is the upper surface of said substrate is the  $\{-100\}$  plane or inclined by several degrees from the  $\{-100\}$  plane, and said ridge portion extends in the  $\langle 0-11 \rangle$  direction. Figure 1 of Narui discloses a semiconductor laser wherein the substrate 1 has a (100) surface orientation and a ridge portion extending in the  $[011]$  direction (see column 1, lines 12-31). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to further modify the invention of Hayashi by orienting the upper surface of the substrate in the  $\{-100\}$  plane and extending the ridge portion in the  $\langle 0-11 \rangle$  direction. The ordinary artisan would have been motivated to modify Hayashi in the manner described above for the purpose of fabricating a low threshold current semiconductor laser.

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*Conclusion*

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chino et al. discloses a cladding layer with a ridge portion that has an angle of inclination between 60 and 90 degrees.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (703) 305-4396.

The examiner can normally be reached from 8:00 AM-4:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
EDDIE LEE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800

Matthew C. Landau

Examiner

September 8, 2002